Analysis of Solana Beach Red Light Camera Enforcement Program

By Jay Beeber, Executive Director, Safer Streets L.A., Member ITE

Background

Safer Streets L.A. is a public policy and research organization dedicated to the adoption of scientifically sound and sensible traffic and transportation practices. Safer Streets L.A. promotes science based solutions to motorist and pedestrian safety issues through the presentation of well researched and verifiable data to elected officials, Commissions and Boards. Safer Streets L.A. provides this information on a voluntary basis and is not paid to interact with elected officials.

Our goal in forwarding the following information is to provide additional information on the use of photo enforcement in Solana Beach, California. We hope that this information proves useful in deliberations as to whether or not to continue the city's photo enforcement program.

About the Author

Jay Beeber is the Executive Director of Safer Streets L.A. and a research fellow with the Reason Foundation concentrating on traffic safety and enforcement. He has served on a number of transportation related working groups including the Subcommittee on Statewide Traffic Signal Timing and the Subcommittee on School Zone Safety for the California Traffic Control Devices Committee, which sets the rules for statewide traffic practices. Mr. Beeber has been deemed an expert witness in court cases involving the proper usage of red light cameras in the State of California. He has authored numerous studies on traffic and pedestrian safety measures.

Introduction

Since October 2004, the City of Solana Beach has maintained an Automated Red Light Enforcement (ARLE) System at the intersections of Highway 101 and Lomas Santa Fe Drive, southbound and at the intersection of Lomas Santa Fe Drive and Solana Hills Drive, northbound and eastbound. At the City Council meeting on September 12, 2017, a staff report will be presented recommending an extension of the red light camera program for an additional five years with three automatic one year extensions.

Safer Streets L.A. reviewed the Staff Report and Supplemental Staff Report and conducted a before and after analysis of collisions both citywide and at the two photo enforced intersections. All data was compiled from the CHP Statewide Integrated Traffic Records System (SWITRS) database. The SWITRS database serves as a means to collect and process data gathered from collision scenes by multiple police agencies throughout the state. The database contains complete collision records from January 2001 through December 2016.

Findings

Our analysis determined the following:

1. While it is commendable that the City of Solana Beach has attempted to improve roadway safety through the use of automated enforcement, our analysis shows that there is no clear evidence that the program has made any difference in the number of red light related collisions that have occurred at enforced locations or citywide.

2. At the intersection of Highway 101 and Lomas Santa Fe Drive, the rate of red light related collisions remained the same and rear end collisions increased slightly after the cameras were installed. Further, the severity of collisions may also have increased slightly.

3. At the intersection of Lomas Santa Fe Drive and Solana Hills Drive, the change in the rate of red light related collisions was not statistically significant. The northbound enforced approach to this intersection had no red light related collisions either before or after the cameras were installed. It is unclear why this intersection approach was chosen for automated enforcement.

4. Citywide, the rate of red light related collisions has **remained unchanged** before and after the cameras were installed.

5. Although the city has issued over 25,000 citations since automated ticketing began in 2004 (now over $500 each), it appears that the Solana Beach red light camera program **has not led to an increase in safety** in the city.

(continued)

Detailed Analysis

The Supplemental Staff Report incorrectly provides an analysis of the red light camera program by comparing the *total* accident rates before and after the cameras were installed rather than the accident rates for red light related collisions only. No study has ever shown that red light cameras have an effect on the rates of other categories of collisions not related to red light running, such as unsafe lane changes, failure to yield, unsafe turning, and speed unsafe for conditions. Therefore, a change in red light running collisions is the proper criterion for the evaluation of the effectiveness of red light camera systems, as collisions caused by red light running are the only type of collision that can reasonably be expected to be reduced through the use of red light cameras. Red light related collisions are those where the primary collision factor is listed in the SWITRS database as a red light violation (CVC 21453).

Highway 101 and Lomas Santa Fe Drive

Cameras were installed in October 2004. In our before and after analysis, we therefore used 2001 through 2004 as the before period and 2005 through 2016 as the after period.

Red light running collisions

Highway 101 @ Lomas Santa Fe Dr Red Light Related Collisions	
Year	Collisions
2001	0
2002	1
2003	1
2004	0
2005	0
2006	1
2007	1
2008	1
2009	0
2010	2
2011	0
2012	1
2013	0
2014	0
2015	0
2016	0
Average 2001 -2004	0.5
Average 2005 -2016	0.5

As can be seen from the table at left, the annual number of red light running collisions has remained constant. The two collisions which occurred prior to red light camera enforcement were property damage only with no injuries. Of the six collisions that have occurred at this intersection since camera enforcement began, four were property damage only, one resulted in complaint of pain, and one resulted in severe injuries.

Overall, the presence of the enforcement cameras appears to have had no effect on the number of red light running collisions that occur at this intersection. However, the severity of collisions has increased slightly. These results suggest that the cameras have not improved safety at this intersection.

Rear end collisions

Highway 101 @ Lomas Santa Fe Dr Rear End Collisions	
Year	Collisions
2001	0
2002	1
2003	0
2004	1
2005	2
2006	1
2007	3
2008	0
2009	0
2010	1
2011	3
2012	1
2013	2
2014	2
2015	0
2016	0
Average 2001 -2004	0.5
Average 2005 -2016	1.3

The average number of annual rear end collisions within 100 feet of the intersection increased 160% after the cameras were installed. Rear end collisions have been known to increase in the presence of red light cameras as some drivers tend to over-react and slam on their brakes in order to avoid a potential ticket. This may have occurred at this location, though a statistical analysis using a paired T-test determined that the change was not statistically significant.

Results

In the categories relevant to the use of red light automated enforcement, red light running collisions and rear end collisions, there was no change in the number of red light related collisions and an **increase in rear end collisions** at this intersection after photo enforcement was implemented. Further, since there were few red light related collisions in the years prior to the start of automated ticketing, this intersection was likely not a good candidate for the use of red light cameras. At best, red light cameras have had no effect on traffic safety at this location and may have caused a marginal decrease in safety due to an increase in rear end collisions.

Lomas Santa Fe Drive and Solana Hills Drive

Lomas Santa Fe Dr @ Solana Hills Dr Red Light Related Collisions	
Year	Collisions
2001	1
2002	3
2003	0
2004	0
2005	0
2006	0
2007	1
2008	0
2009	0
2010	2
2011	0
2012	0
2013	1
2014	0
2015	0
2016	0
Average 2001 -2004	1
Average 2005 -2016	0.3

At this intersection, the annual number of red light running collisions decrease slightly, though a statistical analysis using a paired T-test determined that the change was not statistically significant. This test shows that the number of collisions that occur each year at this intersection is independent of whether or not red light cameras were present. Further, there were no collisions at this intersection for more than two years prior to camera installation. It is not possible that the reduction in collisions after 2002 could be due to camera enforcement since automated ticketing did not occur until two years after the spate of red light running collisions had abated. This is additional evidence that the cameras have had no effect on whether or not red light running collisions occur at this location.

It should also be noted that the northbound approach to this intersection produces a high number of citations, consisting almost exclusively of rolling right turn tickets. However, according to the accident statistics, there have been no red light running collisions since at least 2001 on either the northbound or southbound approaches to this intersection.

Results

A statistical analysis of the number of red light running collisions occurring before and after red light cameras were installed suggests that automated ticketing likely had no effect at this location. Red light running collisions abated more than two years before automated ticketing began and changes in red light running collisions were shown to be due to random fluctuations and/or regression to the mean.

There is therefore no evidence that red light cameras have had any positive effect on traffic safety at this intersection.

Citywide Collisions

For completeness, we also include an evaluation of red light running collisions citywide, before and after the cameras were employed. As was the case at the intersections enforced by red light cameras, the is no statistical difference in the number of red light related collisions that occur in Solana Beach from year to year, regardless of whether or not red light cameras were present.

Rolling Right Turns

On northbound Solana Hills Drive at Lomas Santa Fe Drive, almost all citations issued are for rolling right turns. Our analysis of 11 years of statewide collision data shows that rolling-right-turns, while technically impermissible, rarely ever result in collisions involving motor vehicles, bicyclists, or pedestrians. We determined that rolling-right-turns represented just 0.075% (75/1000th of 1%) of all collisions each year in California. Rolling-right-turns involving pedestrians are just 63/10,000th of 1% of all collisions in the state each year and rolling-right-turns involving bicyclists are just 111/10,000th of 1% of all collisions in the state each year. 76% of rolling-right-turn collisions do not involve a pedestrian or bicyclist.

As noted previously, there have been no red light related collisions (right turn or otherwise) at the northbound Solana Hills Drive approach since at least 2001, the earliest date that data is available. Citywide, there has been only one red light related collision involving a pedestrian – in 2015, many years after the cameras were installed on city streets. This one collision did **not** involve the 74 year old driver making a right turn on red. There have been no red light related collisions involving bicyclists either before or after installation of cameras.

The relative lack of danger involved when drivers make slow rolling right turns on red is likely the reason that the vast majority of the public sees rolling right turn enforcement, with its accompanying $500 citation, as generally unfair and geared towards revenue generation, rather than a means to improve traffic safety. While one might argue that drivers simply need to stop on red prior to turning to avoid such a ticket, the reality is that human beings are imperfect and mostly attempt to comply with the spirit of the law, if not the letter of the law. Unquestionably, failure to stop prior to turning right on red is a technical violation of the vehicle code, but it is a fairly innocuous offense, akin to driving a mile or two over the speed limit – something almost everyone does on a regular basis. We include this issue within our discussion as while the city may have no control over the fine for the violation, the city has full control over whether this particular violation is enforced using red light cameras or the degree to which it is enforced. For example, the City of West Hollywood only cites for a right turn violation if the reviewing officer determines that another roadway user was placed at risk by the behavior of the offending driver. If the City of Solana Beach chooses to continue the red light camera program, we would hope that city leaders engage in a frank discussion as to whether a similar policy might better serve the people of Solana Beach.

In an email to city engineer Dan Goldberg dated 9/11/17, Redflex representative, Edward Tiedje claims

that Solana Beach PD already has a policy of only issuing tickets for right turns that are "egregious". In support, Tiedje claims that SBPD rejects 45% of right turn incidents. However, what the vendor has not explained is that a large number of violations of all types are rejected for various reasons such as inability to read the license plate or capture a clear picture of the driver, etc. These types of rejections don't qualify under the category of "leniency".

A review of the Redflex monthly reports for the northbound Solana Hills Drive approach (almost exclusively right turns) shows that the actual rejection rate of potential rolling right turn violations is less than 10%. As evidence, we've attached for your review, randomly selected Redflex Customer Management Reports from October 2012 and March 2014 (we did not have access to more recent reports). For the northbound Solana Hills Drive approach (SOL-SHLO-01), potential violations in October 2012 totaled 174. SBPD rejected a total of 10 violations under the categories of "Police Discretion" and "Safe Turn on Red". This calculates to a rejection rate of only 5.8%. For March 2014, there were a total of 179 violations captured and SBPD rejected 15 for a rejection rate of 8.4%. Unquestionably, the rejection rate for right turn violations due to not being "egregious" enough to warrant a citation is nowhere near 45%. Council may wish to inquire of the vendor why they chose to provide misleading information to city staff and to consider if the city wishes to continue to do business with a vendor that appears to continue to be ethically challenged. To truly get a sense of what types of rolling right turns are being issued $500 tickets, one might wish to review the video of all the right turn tickets issued in a particular month, not just those that are cherry-picked to find the most egregious violations.

Conclusions

Based on our analysis, the City of Solana Beach's red light camera program appears to have had no positive effect on traffic safety in the city, even after more than a decade of enforcement and the issuance of over 25,000 tickets, each of which costs defendants over $500 per citation. Further, it appears that the cameras were installed in locations that did not have a prior red light running collision problem.

While the implementation of this program was likely well intended by those who initiated it, the program has not achieved the intended results. Additionally, there is concern that the presence of the cameras may be contributing to an increase in rear end collisions at at least one location.

Due to the failure of the program to increase traffic safety, the excessive fines imposed by the state, and the economic damage done to both defendants and the city from loss of revenue and damage to the city's reputation, Council Members may wish to consider ending the red light camera program and re-deploy police and other staff resources to other efforts that may result in an improvement in traffic safety in Solana Beach.

At the least, council should ensure that any new contract provides for the ability of the city to cancel the program without penalty upon 30 days' notice, a provision which appears in the current contract and which protects the taxpayers of the city from unforeseen circumstances. Further, if the program is continued, council may wish to explore the option of only issuing tickets for rolling right turns if the violator clearly presented a danger to other roadway users.

We hope this information proves useful in your deliberations.

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Customer Management Report (Solana Beach) All Detection Types

01-Oct-2012 to 31-Oct-2012 Operator Id: %

		SOL-101L-01(I)	SOL-LOSH-01(P)	SOL-SHLO-01(P)	TOTAL
Total Processed Incidents		0	105	174	279
Less Uncontrollable Factors					
Obstruction	Driver Obstruction/Duckers	0	6	1	7
	Plate Obstruction	0	1	3	4
	Vehicle Obstruction	0	0	1	1
Police Rejects	Emergency Vehicle Responding	0	1	1	2
	Incorrect/Incomplete DMV	0	0	1	1
	Police Discretion	0	0	1	1
	Safe Turn On Red	0	1	9	10
Policy/Weather	Extended Vehicle	0	0	3	3
	Sun Glare	0	0	26	26
Registration Issues	Out of Country Plate	0	0	1	1
	Paper Plates	0	0	1	1
Total		0	9	48	57
Sub Total Violations		0	96	126	222
Less in Progress		0	0	0	0
Available For Prosecution		0	96	126	222
Less Rejects					
Camera Malfunction	Face Not in Frame	0-00%	0-00%	2-02%	2-01%
	Misc Camera Issue	0-00%	1-01%	0-00%	1-00%
Police Rejects	Driver Unidentifiable images poor	0-00%	1-01%	3-02%	4-02%
Total		0-00%	2-02%	5-04%	7-03%
Approved Violations		0-00%	94-98%	121-96%	215-97%
Total Notices Printed		0-00%	94-98%	121-96%	215-97%

Northbound Solana Hills - right turn enforcement

Leniency 5.8% rejection rate

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Customer Management Report (Solana Beach) All Detection Types

01-Mar-2014 to 31-Mar-2014 **Operator Id: %**

		SOL-101L-01	SOL-LOSH-01	SOL-SHLO-01	TOTAL
Total Processed Incidents		34	101	179	314
Less Uncontrollable Factors					
Obstruction	Driver Obstruction/Duckers	3	3	3	9
	Plate Obstruction	1	2	2	5
	Vehicle Obstruction	1	2	1	4
Police Rejects	Face Obstruction	1	0	1	2
	Incorrect/Incomplete DMV	0	1	0	1
	Invalid Offense	1	0	0	1
	On or Passed the Stop Bar (PD).	2	1	5	8
	Police Discretion	2	2	0	4
	Safe Turn On Red	3	2	15	20
Policy/Weather	Extended Vehicle	0	0	2	2
	Sun Glare	1	0	41	42
Registration Issues	Out of Country Plate	1	0	0	1
	Paper Plates	0	2	5	7
Total		16	15	75	106
Sub Total Violations		18	86	104	208
Less in Progress		0	0	0	0
Available For Prosecution		18	86	104	208
Less Rejects					
Camera Malfunction	Face Camera Flash	1-06%	0-00%	0-00%	1-00%
	Face Not in Frame	0-00%	0-00%	3-03%	3-01%
	Misc Camera Issue	0-00%	2-02%	0-00%	2-01%
Police Rejects	Driver Unidentifiable images poor	11-61%	7-08%	42-40%	60-29%
	Red-light not visible in	0-00%	1-01%	0-00%	1-00%

Northbound Solana Hills - right turn enforcement

Leniency 8.4% rejection rate

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